

## REMARKS

Claims 1 through 31 were pending in this application. At present, claims 1 and 2 stand rejected under 35 U.S.C. § 103(a) in view of the patent to Kobayashi et al. (United States Patent No. 5,998,863, issued December 7, 1999, and having a filing date of July 15, 1997, hereinafter “Kobayashi”) and further in view of the patent to Eastman et al. (United States Patent No. 4,230,173, issued October 28, 1980, and having a filing date of September 5, 1978, hereinafter “Eastman”). Claim 3 stands rejected under 35 U.S.C. § 103(a) in view of Kobayashi and Eastman, and further in view of the patent to Terao et al. (United States Patent No. 6,005,772, issued December 21, 1999, and having a filing date of May 20, 1998, hereinafter “Terao”). Claim 4 stands rejected under 35 U.S.C. § 103(a) in view of Kobayashi and Eastman, and further in view of the patent to Berenholz et al. (United States Patent No. 5,168,919, issued December 8, 1992, and having a filing date of June 29, 1990, hereinafter “Berenholz”). Claim 5 stands rejected under 35 U.S.C. § 103(a) in view of Kobayashi and Eastman, and further in view of the patent to Mizuno et al. (United States Patent No. 5,522,452, issued June 4, 1996, and having a filing date of November 22, 1993, hereinafter “Mizuno”). Applicants previously elected the species of claims 1 through 5, with traverse, further indicating that claim 1 is generic to all species recited in dependent claims 2 through 10. The Examiner has indicated that claim 1 is generic, and has withdrawn claims 6 through 31 from consideration. Applicants have canceled claims 11 through 31, without prejudice. Claims 6 through 10 remain withdrawn, pending allowance of generic claim 1. Based on the Remarks presented herein, Applicants respectfully traverse the rejections of claims 1 through 5. Applicants have added new claims 32 through 36. Applicants believe that no new matter has been added. Accordingly, claims 1 through 10 and 32 through 36 are therefore pending in the present application. Reconsideration of this application is respectfully requested.

Applicants first wish to thank the Examiner for reconsidering the restriction requirement in light of the generic claim (claim 1). Applicants submit that claims 6 through 10 are in the form required by 37 C.F.R. § 1.141(a): claims 6 through 10 represent a reasonable number of species and are written in dependent form, thereby including all recitations of generic claim 1. In

the event that generic claim 1 is found allowable, Applicants submit that dependent claims 6 through 10 may be claimed in the present application. See 37 C.F.R. § 1.141(a); MPEP §§ 809.02, 809.02(b), 809.02(c). Claims 6 through 10, therefore, remain withdrawn subject to allowance of generic claim 1.

In response to the final restriction requirement, Applicants have canceled claims 11 through 31 without prejudice.

Regarding the rejections of claims 3 through 5 under 35 U.S.C. § 103(a), Applicants have summarized the rejections as they believe the Examiner intended, rather than as expressly documented in the Office Action mailed September 9, 2003. In particular, while claim 1 was rejected in view of Kobayashi and further in view of Eastman, the rejections of claims 3 through 5 do not expressly indicate that they are based in part upon Eastman. For example, the Office Action indicates that claim 3 stands rejected in view of Kobayashi “as applied to claims 1 and 2 above, and further in view of Terao...” Since claims 1 and 2 stand rejected in view of Kobayashi and further in view of Eastman, Applicants have assumed that claim 3 stands rejected under Kobayashi *and Eastman* as applied to claims 1 and 2, and further in view of Terao. Similarly, Applicants have assumed that claim 4 stands rejected in view of Kobayashi, Eastman, and Berenholz, rather than Kobayashi and Berenholz as stated in the Office Action. Applicants have assumed that claim 5 stands rejected in view of Kobayashi, Eastman, and Mizuno, rather than Kobayashi and Mizuno as stated in the Office Action. In order to clarify the record, Applicants request confirmation or correction of the above.

### **Claim Rejections**

Applicants first note that generic claim 1 is an independent claim. Claims 2 through 5 depend from this independent claim, and therefore incorporate all of the recitations of the base claim. Applicants’ remarks below, therefore, will focus on independent claim 1, since if this claim is shown to be allowable over the art cited by the Examiner, then all claims which depend from this claim are therefore also allowable.

As previously noted, claim 1 currently stands rejected under 35 U.S.C. § 103(a) in view of Kobayashi, and further in view of Eastman. Applicants respectfully traverse the rejection of claim 1 based upon the cited art, on several grounds. First, Applicants submit that Eastman is non-analogous art. Second, Applicants submit that the Examiner has not established a suggestion to combine Eastman with Kobayashi. Third, Applicants submit that Kobayashi teaches against a combination with Eastman. Fourth, Applicants submit that Kobayashi fails to disclose, teach, or suggest at least two aspects of Applicants' invention as recited in claim 1, and in fact strongly teaches against both aspects.

Under 35 U.S.C. § 103(a), a determination of obviousness is a determination that “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a). The pertinent factual inquiries in making a determination of obviousness are 1) the scope and content of the prior art, 2) the level of ordinary skill in the art, 3) the differences between the claimed invention and the prior art, and 4) objective indicia of nonobviousness. See Graham v. John Deere Co., 383 U.S. 1 (1966). In assessing the scope and content of the prior art, courts have limited the prior art scope to “analogous” art. See In re Clay, 966 F.2d 656, 23 USPQ2d 1058 (Fed. Cir. 1992), In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). A two part test has been developed to determine whether art is analogous: whether the art and applicant’s invention are from the same “field of endeavor,” or whether the art pertains to “the particular problem with which the inventor was involved.” In re Clay, 966 F.2d at 659, 23 USPQ2d at 1060 (citations omitted). Applicants submit that Eastman fails both tests.

Applicants submit that Eastman is not within the same field of endeavor as Applicants’ claimed invention. As noted in the FIELD OF THE INVENTION of Applicants’ specification as filed, “[t]he present invention relates in general to a cooling apparatus for an electronic module.” Applicants submit that Eastman pertains to the use of a flue gas-to-air heat exchanger to reclaim waste heat from flue gases resulting from various industrial processes. See Eastman, column 1 lines 6-9, and 53-55. Reclaiming heat from flue gases is not within the same field of endeavor as

cooling electronic modules. Applicants submit that Eastman is therefore not within the same field of endeavor as Applicants' claimed invention.

Applicants submit that Eastman does not pertain to the particular problem with which Applicants were involved. As noted in the Background portion of Applicants' specification as filed, Applicants were involved with the problem of providing "an electronic module apparatus capable of being cooled by airflow, which employs an enhanced method of transferring heat from device to cooling fins, and which is capable of efficient operation when the module is placed directly within the cooling airflow, and the module is oriented vertically." See Applicants' specification as filed, paragraph 14. In contrast, Eastman identifies two problems with prior heat exchanger art: "the danger of cooling the hot gas to the point of condensing some of the corrosive chemicals in it," and "the lack of accomodation [sic] for normal required maintenance and emergency repairs." See Eastman, col. 1 lines 32-34 and 44-45, respectively. The problems cited by Eastman are unrelated to efficient air cooling of vertically oriented electronic modules. Applicants submit, therefore, that Eastman does not pertain to the particular problem with which Applicants were involved. Applicants' invention employs various means, including check valves, to solve the problems described in the Background section of Applicants' specification as filed. The particular problem with which Applicants were concerned must be viewed in terms of the *problem* that confronted the inventors, not their *solution*: defining the problem in terms of the inventors' solution involves impermissible hindsight. See Monarch Knitting Mach. Corp. v. Sulzer Morat GmbH, 139 F.3d 877, 45 USPQ2d 1977 (Fed. Cir. 1998). While Eastman appears to discuss the use of check valves (i.e., Applicants' solution) as an optional feature, it does not appear to address electronic device orientation (i.e., the problem with which Applicants were involved).

Applicants therefore submit that Eastman is not analogous art. The rejection of claim 1 under 35 U.S.C. § 103(a) based upon this art therefore cannot stand. Applicants respectfully traverse the rejection of claim 1 on this ground alone, and request that the rejection of claim 1 be withdrawn.

With regard to Applicants' other grounds for traversing the rejection of claim 1 under 35 U.S.C. § 103(a), Applicants' attorney first notes that in order for the Examiner to establish a *prima facie* case of unpatentability under 35 U.S.C. § 103(a), the Examiner must provide references showing every claimed feature of Applicants' invention, as well as some suggestion or motivation to combine the references in the manner taught and claimed by Applicants. In so doing, the Examiner is prohibited from relying on hindsight reconstruction, and instead must establish obviousness based on what was known to one of ordinary skill in the art at the time of Applicants' invention. Applicants submit that these requirements have not been met.

Applicants submit that the Examiner has not provided objective evidence showing a teaching, motivation, or suggestion to combine Eastman with Kobayashi in order to move the art toward Applicants' invention. The Examiner admits that Kobayashi does not disclose check valves, as recited in Applicants' claim 1. Applicants agree with this characterization of Kobayashi. The Examiner notes that Eastman discloses check valves disposed within a fluid flow path. Regarding a suggestion to combine Eastman with Kobayashi, however, the Examiner appears to provide only the conclusory statement that "[t]herefore it would be obvious to modify Kobayashi's invention by providing a plurality of check valves..." Applicants submit that this assertion, without substantial evidentiary support, is insufficient to establish a *prima facie* case of unpatentability. The Examiner appears to be engaging in impermissible hindsight, using the teachings of Applicants' invention to render Applicants' invention obvious. The requirement of a showing of some suggestion or motivation to combine is an important safeguard against improper hindsight reconstruction. See *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999). It is improper for the Examiner to use Applicants' invention to provide the suggestion or motivation to combine. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). A finding of a suggestion or motivation to combine must be based on objective evidence; unsupported conclusory statements are insufficient. See *In re Lee*, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002). In particular, the Examiner does not provide any reasoning or objective evidence establishing why it would have been obvious to modify the express teachings of Kobayashi by limiting fluid flow to a single direction. Applicants submit, therefore, that the Examiner has not established a suggestion or motivation to combine Eastman with Kobayashi. The rejection of claim 1 under 35 U.S.C. § 103(a) based upon this art therefore cannot stand.

Applicants respectfully traverse the rejection of claim 1 on this ground alone, and request that the rejection of claim 1 be withdrawn.

Applicants further submit that Kobayashi teaches away from a combination with Eastman. In particular, the express teachings of Kobayashi require fluid flow in different directions within each condenser, depending upon device orientation. As noted in Kobayashi, column 2 lines 4 through 10:

It is another object of the present invention to provide a cooling apparatus in which the refrigerant can circulate efficiently even when the apparatus is inclined.

It is further object of the present invention to provide a cooling apparatus in which the refrigerant can circulate efficiently even if the refrigerant tank is disposed in a horizontal direction or a vertical direction.

Therefore, one object of Kobayashi is to provide a device that operates when oriented horizontally (i.e., as in Fig. 1) as well as when oriented vertically (i.e., as in Fig. 3). Applicants submit that the device shown in Figs. 1 and 3 can achieve this objective only if fluid is allowed to flow in either direction through the condenser tubes. When oriented horizontally as in Fig. 1, fluid circulation is “along a route in the order of connection chamber, one ends of the first and second tubes, first and second tubes, the other ends of the first, and second tubes to refrigerant tank.” Kobayashi, column 7 lines 48-50. Fig. 1 illustrates fluid flowing into connection chamber 23, then into the ends of condenser tubes (41a and 42a) in fluid flow communication with connection chamber 23, through tubes 41 and 42, then to the ends of condenser tubes (41b and 42b) nearest the periphery of the device. When oriented vertically as in Fig. 3, however, Kobayashi teaches fluid flow in the opposite direction, through only one condenser tube: “[i]n this embodiment, the refrigerant 30 after boiling and vaporization circulates along a route in the order of refrigerant tank 20, the other end 41b of the first tube, first tube 41, one end 41a of the first tube, connection chamber, and refrigerant tank 20.” Kobayashi, column 9 lines 13-16. Figs. 1 and 3 also include arrows indicating the direction of fluid flow in each orientation. Applicants

submit, therefore, that including one or more check valves within the condenser tubes of the Kobayashi invention results in a device that functions in *some but not all orientations*, contrary to the expressly stated objectives of Kobayashi. Applicants therefore submit that Kobayashi teaches against the use of check valves, and therefore teaches against a combination with Eastman. The rejection of claim 1 under 35 U.S.C. § 103(a) based upon this art therefore cannot stand. Applicants respectfully traverse the rejection of claim 1 on this ground alone, and request that the rejection of claim 1 be withdrawn.

Applicants submit that Kobayashi fails to disclose, teach, or suggest at least two aspects of Applicants' invention as recited in claim 1, and in fact strongly teaches against both aspects. First, as discussed above, Kobayashi teaches a device that may be used in various orientations *provided* fluid flow is not restricted to one direction. Kobayashi therefore teaches against the use of check valves as recited in Applicants' claim 1. Second, Kobayashi does not disclose, and in fact teaches against, the use of a single condenser unit having inlets and outlets located at the device periphery, as recited in Applicants' claim 1. Applicants submit that column 1, lines 18-63 of Kobayashi teach against the use of a single condenser having inlets and outlets located at the device periphery. The following passage is instructive (see Kobayashi, column 1 lines 42-49):

In the above-described cooling apparatus, however, since the single first communication pipe is disposed above the liquid level of the refrigerant in the peripheral edge portion of the refrigerant tank and the single second communication pipe is disposed as to be open below the refrigerant liquid level in the peripheral edge portion of the refrigerant tank, there occurs the following problems when the cooling apparatus itself is inclined.

Kobayashi appears to teach a solution involving two separate condensers or radiators, where one end of each radiator is in fluid flow communication with a central portion of a refrigerant tank, and the other end of each radiator is in fluid flow communication with a peripheral portion of a refrigerant tank. See Kobayashi, column 2 line 15 through column 3 line 3. Applicants' claim 1 recites "a boiling chamber within said evaporator, said boiling chamber having a plurality of *fluid inlet ports disposed proximate one end of said boiling chamber*, said boiling chamber having a

plurality of *fluid outlet ports disposed proximate an opposing end of said boiling chamber*,” contrary to the express teachings of Kobayashi. Applicants submit, therefore, that Kobayashi fails to disclose, teach, or suggest at least two aspects of Applicants’ invention as recited in claim 1, and in fact strongly teaches against both aspects. The rejection of claim 1 under 35 U.S.C. § 103(a) based upon this art therefore cannot stand. Applicants respectfully traverse the rejection of claim 1 on this ground alone, and request that the rejection of claim 1 be withdrawn.

Claim 1 therefore includes recitations that are not taught, disclosed, or suggested by the art upon which the Examiner has relied. Applicants therefore respectfully traverse the rejection of claim 1 under 35 U.S.C. § 103(a) based upon based upon Kobayashi and Eastman, for each of the reasons stated herein. Applicants therefore request that the rejection of claim 1 under 35 U.S.C. § 103(a) be withdrawn.

Claims 2 through 5 depend from claim 1, and therefore incorporate by reference all recitations of claim 1. Since claim 1 includes one or more recitations that are not taught, disclosed, or suggested by the art upon which the Examiner has relied, claims 2 through 5 also include one or more recitations that are not taught, disclosed, or suggested by the cited art. Applicants therefore respectfully traverse the rejections of claims 2 through 5, and request that the rejections be withdrawn.

Applicants have added new claim 32, which depends from claim 2 and therefore incorporates all recitations of claim 2 (and therefore of independent claim 1). Claim 32 is therefore allowable by virtue of its dependence upon an allowable base claim. In addition, Applicants submit that new claim 32 introduces a recitation that is not taught, disclosed, or suggested by the cited art: liquid cooling fluid at a higher level in the boiling chamber than the level of liquid in the condenser. Applicants submit that this feature is not taught, disclosed, or suggested by any of the art cited by the Examiner: new claim 32 is therefore allowable for this reason alone, as well as by virtue of its dependence upon an allowable base claim. Support for new claim 32 is found throughout Applicants’ specification as filed, such as paragraphs 46 and 51, for example.

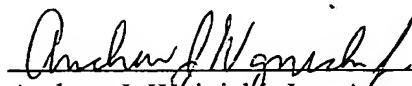


Applicants have also added new claims 33 through 36. Claim 33 includes all recitations of claims 1 and 2 as filed, plus new claim 32. Claims 34 through 36 are analogous to claims 3 through 5 as filed, respectively. All remarks provided herein therefore pertain to new claims 33 through 36, and no new matter has been added.

In summary, for the reasons presented above, Applicants respectfully traverse the rejections of claims 1 through 5, and respectfully request that the rejections be withdrawn. Applicants have added new claim 32, which Applicants submit is allowable both by virtue of its dependence upon an allowable base claim, as well as by virtue of an additional recitation not taught, disclosed, or suggested by the cited art. Applicants have added new claims 33 through 36, which Applicants submit are allowable for the same reasons presented with respect to claims 1 through 5 and new claim 32. Finally, Applicants submit that claims 6 through 10 are in the form required by 37 C.F.R. § 1.141(a). Applicants therefore submit that claims 1 through 10 as filed, and new claims 32 through 36, are in condition for allowance.

Accordingly, it is now seen that all of the Applicants' pending claims are in condition for allowance. Therefore, early notification of the allowability of Applicants' claims is earnestly solicited. Furthermore, if there are any matters which the Examiner feels could be expeditiously considered and which would forward the prosecution of the instant application, Applicants' attorney wishes to indicate his willingness to engage in any telephonic communication in furtherance of this objective. Accordingly, Applicants' attorney may be reached for this purpose at the number provided below.

Respectfully submitted,



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